NORTH SOUTH UNIVERSITY

Department of Electrical & Computer Engineering

CSE327

Section: 10

Faculty: Sarnali Basak(SLB)

Report with Design Submission

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Group Name: MUEZZA

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Introduction:

The "Mental Health Counseling Center Web Application" is a project aimed at optimizing and modernizing the management of mental health counseling services. The platform will serve three user groups: counselors,patients, and administrators. It will support patient management, appointment scheduling, and secure record-keeping, ensuring a seamless, efficient, and user-centric experience for all .

Problem Statement:

Our application seeks to address the inefficiencies of the current mental health services. Many mental health centers rely on disjointed, fragmented systems for patient management, appointment scheduling, and record-keeping and moreover their UI is not organized, making it painful for the users to use it.

Vision Statement:

Our proposed web application aims to resolve the challenges faced by most application of this type by centralizing patient management, automating appointment scheduling, and simplifying record-keeping.This approach enhances the user experience for patients, counselors, and administrators alike.

Functional Requirements:

These specify the core functionalities the system must perform to meet its objectives:

1. User Management

- Implement distinct user roles: counselors, patients, and administrators.
- Provide secure user registration and login functionality.
- Allow users to update and manage their profiles.

2. Patient Records and History

- Maintain a comprehensive patient database with details such as name, contact, and medical history.
- Allow recording of multiple visit records under a single patient profile.
- Store detailed updates of a patient’s mental health condition for every session.

3. Appointment Management

- Patients can request appointments with their preferred or assigned counselors.
- Counselors can view, approve, or reject appointments.
- Administrators can approve, deny, or reassign appointments as needed.
- Provide a search and filter system to show available appointment slots.

4. Payment Tracking

- Record and display payment history for each patient.
- Enable payment options via Mobile Financial Services (MFS) and card systems.
- Provide administrative tools for efficient management of payments.

5. Role-Specific Functionalities

- **Patients**:
  - Create accounts, book appointments, and view payment history.
  - Submit feedback on counseling sessions.
- **Counselors**:
  - Manage patient records and counseling schedules.
  - Update patients' mental health conditions and session notes.
- **Administrators**:
  - Oversee the entire system and manage user accounts.
  - Approve or deny appointment requests and reassign counselors.
  - Monitor payment records and system health.

6. Feedback System

- Allow patients to submit feedback about their counseling experience.
- Enable counselors to provide feedback about the patients, if required.

Non-Functional Requirements:

These define the quality attributes, performance, and system constraints:

1. Performance

- The system should support up to **30,000 concurrent users** efficiently.
- Ensure the website loads within **3 seconds** under normal traffic conditions.

2. Security

- Implement **data encryption** for sensitive information such as personal details and payments.
- Ensure confidential patient and counselor information is accessible only to authorized users.
- Use **multiple databases** to enhance security and data isolation.

3. Reliability

- Regular **data backups** every Friday at midnight (00:00).
- System availability ensured during peak usage with minimal downtime.

4. Data Management

- Automatically delete unnecessary or outdated data every **30 days** to optimize storage.

5. Scalability

- Ensure the system can scale to accommodate future user growth without performance degradation.

6. User Experience

- Provide an intuitive and user-friendly interface for all roles.
- Enable quick access to key features and minimize navigation complexity.

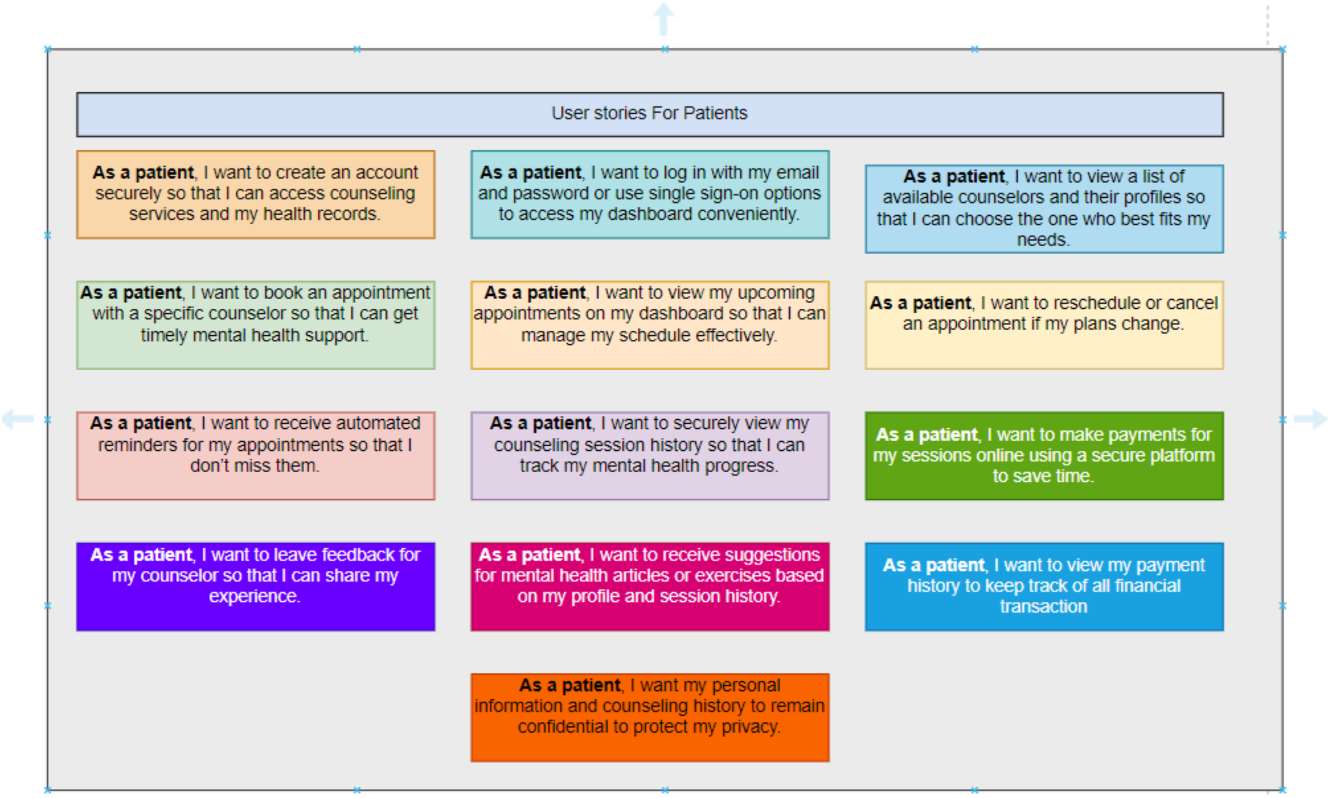
7. Maintainability

- Schedule **weekly system updates** for bug fixes and feature enhancements.
- Ensure easy integration of new features or updates without disrupting existing services.

8. Accessibility

- Ensure the platform is compatible with assistive technologies to support differently-abled users.

User stories:



User stories For Patients

As a patient, I want to create an account securely so that I can access counseling services and my health records.

As a patient, I want to log in with my email and password or use single sign-on options to access my dashboard conveniently.

As a patient, I want to view a list of available counselors and their profiles so that I can choose the one who best fits my needs.

As a patient, I want to book an appointment with a specific counselor so that I can get timely mental health support.

As a patient, I want to view my upcoming appointments on my dashboard so that I can manage my schedule effectively.

As a patient, I want to reschedule or cancel an appointment if my plans change.

As a patient, I want to receive automated reminders for my appointments so that I don't miss them.

As a patient, I want to securely view my counseling session history so that I can track my mental health progress.

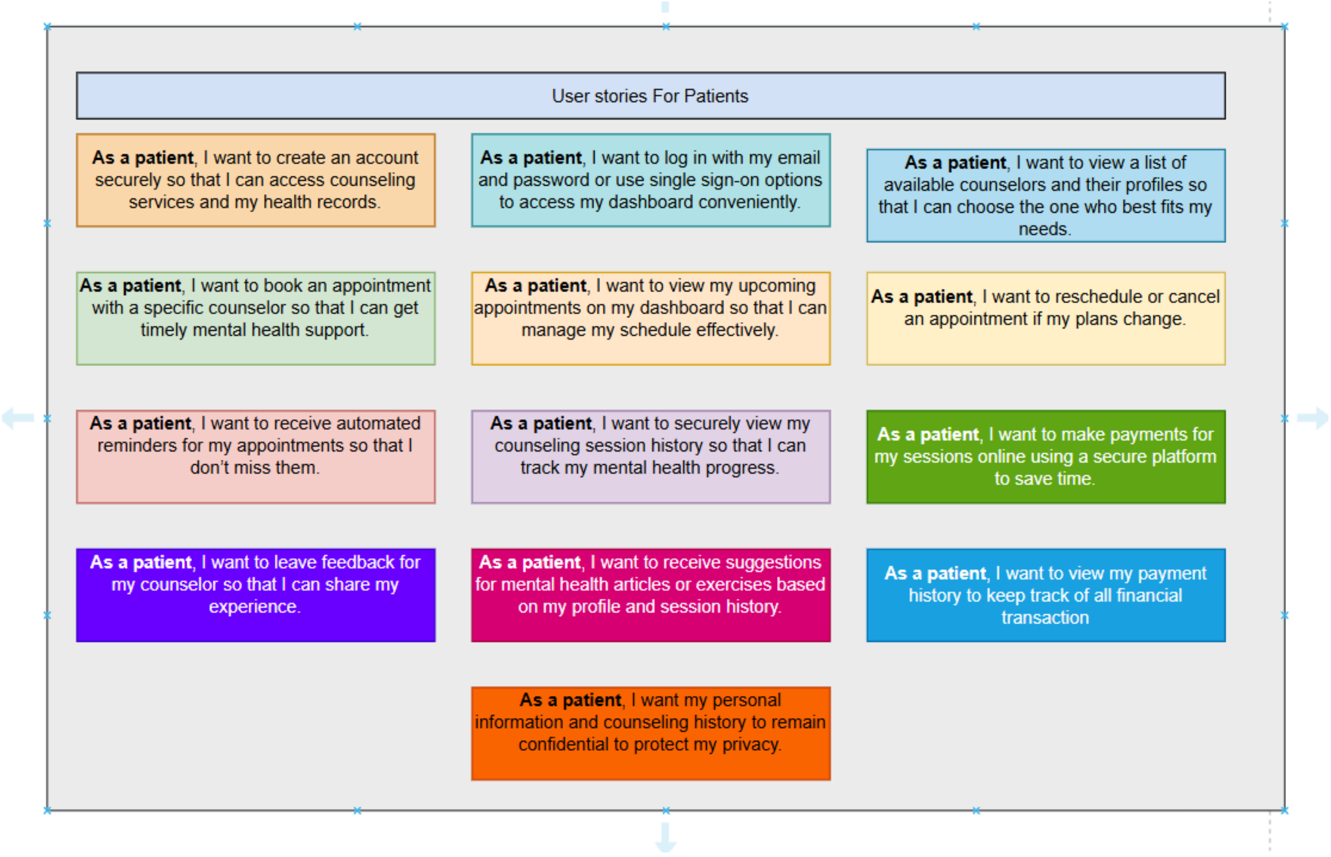
As a patient, I want to make payments for my sessions online using a secure platform to save time.

As a patient, I want to leave feedback for my counselor so that I can share my experience.

As a patient, I want to receive suggestions for mental health articles or exercises based on my profile and session history.

As a patient, I want to view my payment history to keep track of all financial transaction

As a patient, I want my personal information and counseling history to remain confidential to protect my privacy.



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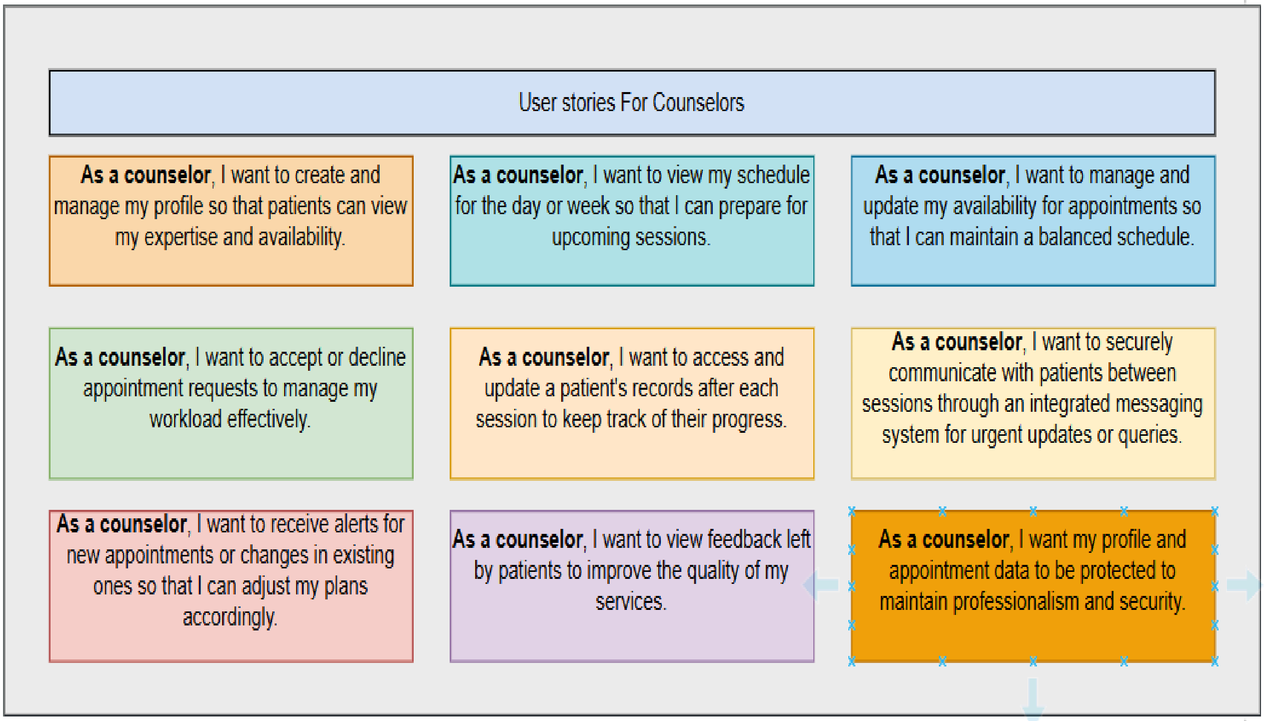


User stories For Counselors

As a counselor, I want to create and manage my profile so that patients can view my expertise and availability.

As a counselor, I want to view my schedule for the day or week so that I can prepare for upcoming sessions.

As a counselor, I want to manage and update my availability for appointments so that I can maintain a balanced schedule.

As a counselor, I want to accept or decline appointment requests to manage my workload effectively.

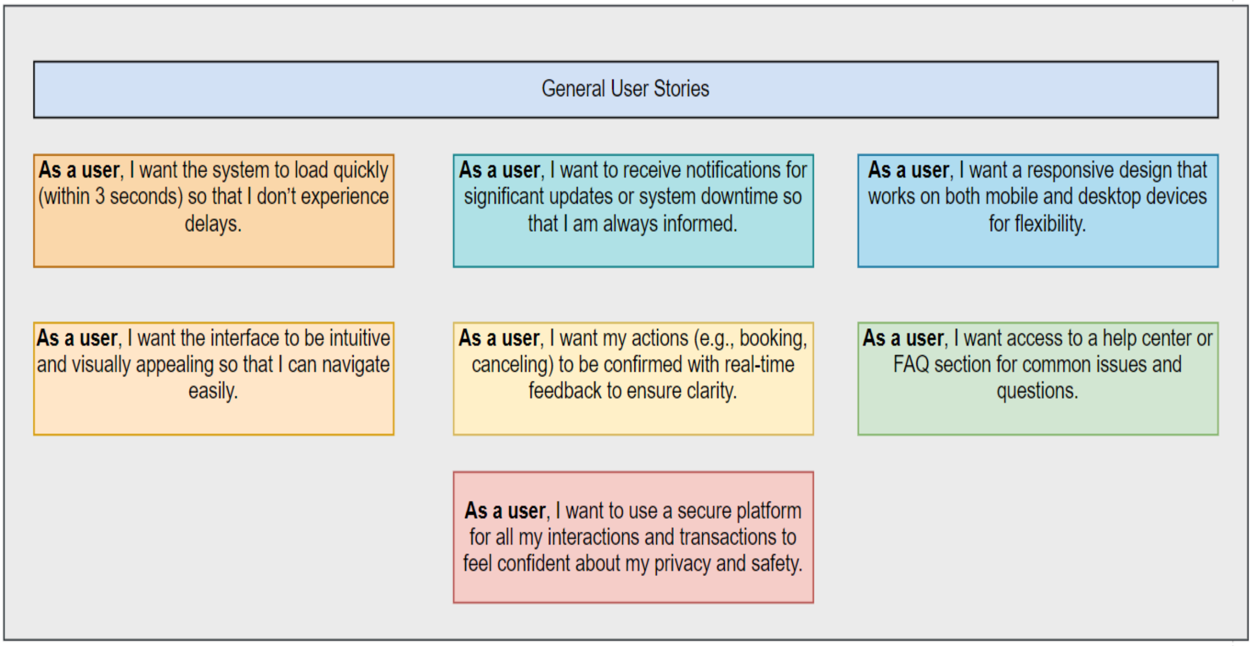
As a counselor, I want to access and update a patient's records after each session to keep track of their progress.

As a counselor, I want to securely communicate with patients between sessions through an integrated messaging system for urgent updates or queries.

As a counselor, I want to receive alerts for new appointments or changes in existing ones so that I can adjust my plans accordingly.

As a counselor, I want to view feedback left by patients to improve the quality of my services.

As a counselor, I want my profile and appointment data to be protected to maintain professionalism and security.



General User Stories

As a user, I want the system to load quickly (within 3 seconds) so that I don't experience delays.

As a user, I want to receive notifications for significant updates or system downtime so that I am always informed.

As a user, I want a responsive design that works on both mobile and desktop devices for flexibility.

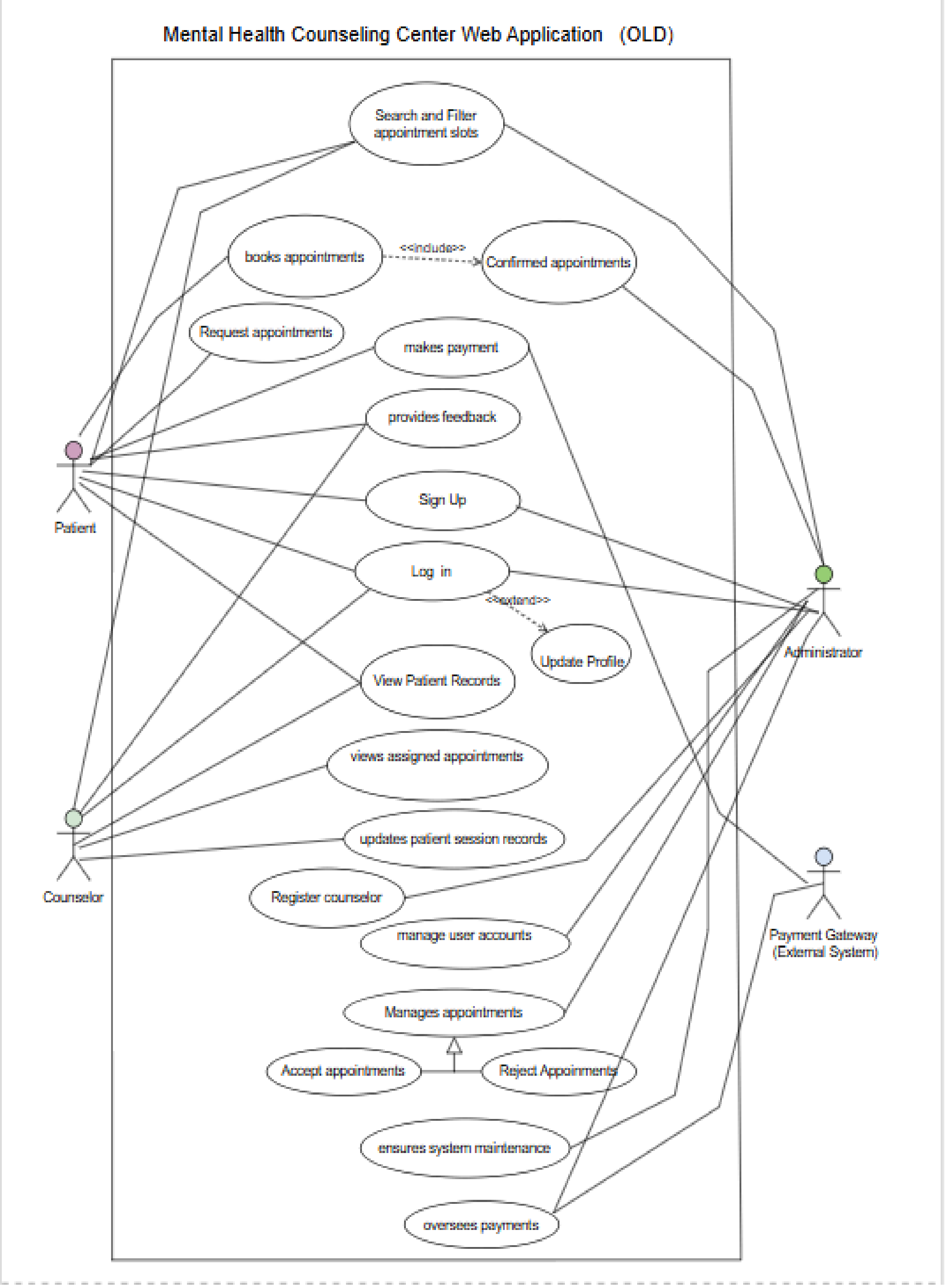
As a user, I want the interface to be intuitive and visually appealing so that I can navigate easily.

As a user, I want my actions (e.g., booking, canceling) to be confirmed with real-time feedback to ensure clarity.

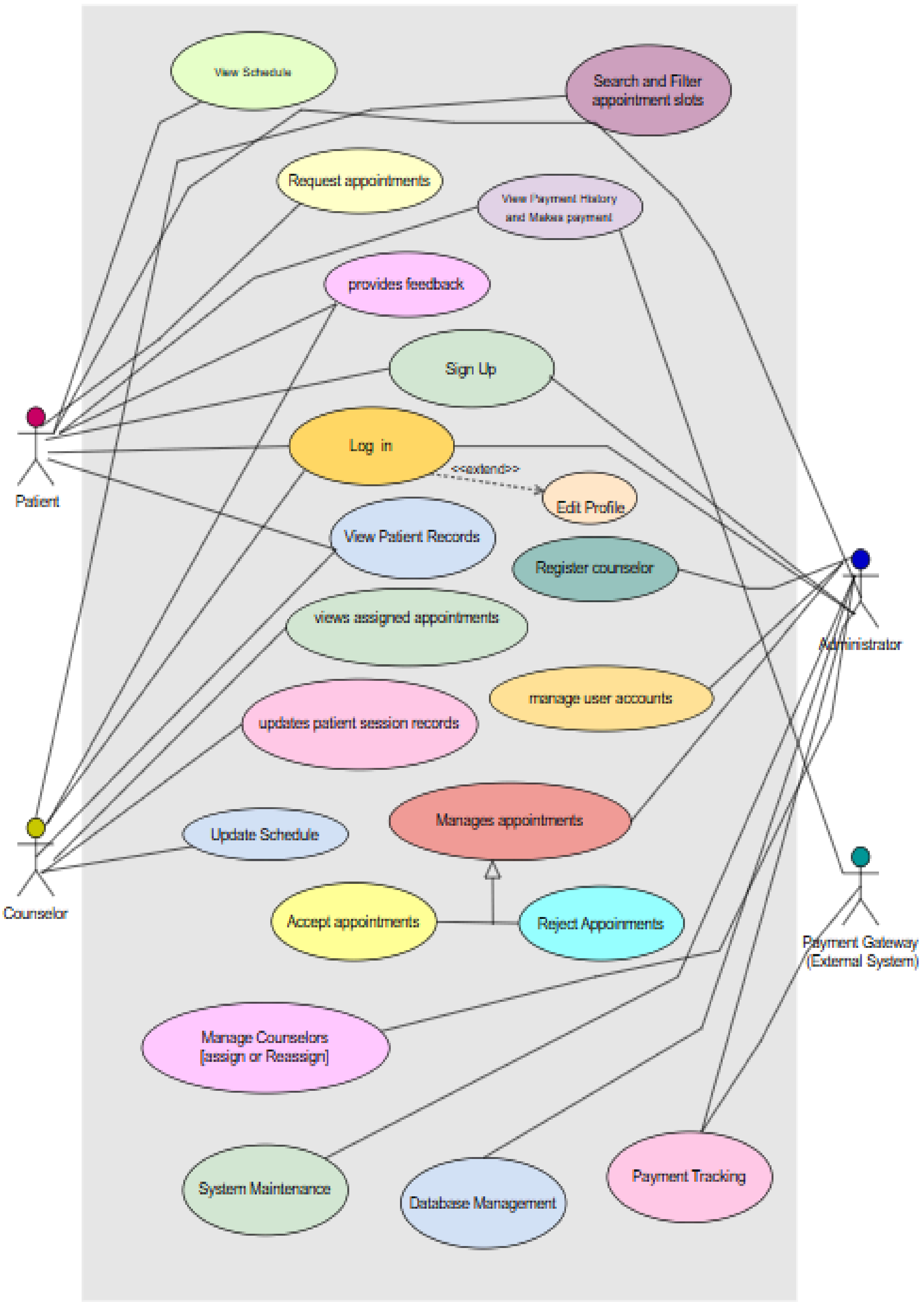
As a user, I want access to a help center or FAQ section for common issues and questions.

As a user, I want to use a secure platform for all my interactions and transactions to feel confident about my privacy and safety.

Use Case Diagram:



Mental Health Counseling Center Web Application (Updated)



Use Cases:

For Patients:

- **Register/Login**: Create and access a secure account.
- **Request Appointment**: Request an appointment with a counselor.
- **View Schedule**: Access upcoming and past appointment details.
- **View Payment History**: Check payments made for services.
- **Submit Feedback**: Provide feedback for the counselor or system.
- **View Payment History and Makes payment**

For Counselors:

- **Login**: Access their account and dashboard.
- **Manage Schedule**: Update availability and view appointments.
- **Update Patient Records**: Record session notes and updates.
- **Submit Feedback**: Offer feedback on the platform or administrative processes.
- **provides feedback**

For Administrators:

- **Register/Login**: Create and access a secure account.
- **User Management**: Create, modify, or delete user accounts.
- **Approve/Deny Appointments**: Review and act on appointment requests.
- **Manage Counselors**: Assign or reassign patients to counselors.
- **Payment Tracking**: Oversee financial records and transactions.
- **System Maintenance**: Monitor the dashboard and perform updates.
- **Database Management**: Encrypt sensitive data, schedule backups, and delete outdated information.

Use case Specification:

1)Use Case Name: User Signup to the System:

Actor: User (Patient, Counselor, or Administrator)

Scenario / Description:

1. The user accesses the signup page from the website.
2. The user provides required information, including name, email/phone, password, and role (patient, counselor, or administrator).
3. The system validates the provided information (e.g., checks for existing accounts with the same email/phone).
4. If validation passes, the system saves the user information to the database.
5. The system sends a confirmation message (email/SMS) to the user for verification.

Exceptions:

1. The required page is not found or inaccessible.
2. The user provides incomplete or invalid information.
3. The database connection fails during the signup process.

Preconditions:

1. The URL of the signup page must be accessible.
2. The system must be connected to the database.
3. The system must have email/SMS functionality enabled for sending confirmation messages.

Postconditions:

1. **Successful Signup:**
   - The user’s information is stored in the database.
   - The user receives a confirmation message and can log in after verification.
2. **Unsuccessful Signup:**
   - The system shows an error message and asks the user to correct the information.
3. **Exception:**
   - The system stays on the signup page and displays an error if possible.

2)Use Case Name: User Login to the System:

Actor: User (Patient, Counselor, Administrator)

Scenario / Description:

1. Input user ID (email or phone number) and password.
2. System checks user ID and password (user authentication).
3. If authentication succeeds, the system redirects the user to their respective dashboard.
4. Optionally, the system saves the user ID and password (using cookies) for future logins if "Remember Me" is selected.

Exceptions:

1. Required page not found: The login page cannot be accessed due to a server issue.
2. No database connection: The system is unable to authenticate the user due to a database connection failure.
3. Invalid credentials: Incorrect user ID or password is entered.

Preconditions:

1. URL of the login page must be accessible from a web browser.
2. The user must already be registered in the system.

Postconditions:

1. Successful login: The user is logged into the system and redirected to their dashboard.
2. Unsuccessful login: The system remains on the login page and displays an error message.
3. Exception: If the system encounters issues, the user remains on the same page with a failure notification.

3)Use Case Name: Request Appointment;

Actor: Patient

Scenario / Description:

1. Patient logs into the system.
2. Patient navigates to the "Request Appointment" section.
3. Patient selects a preferred counselor or views available counselors.
4. The system displays the available time slots for the selected counselor.
5. Patient selects a suitable time slot and submits the appointment request.
6. The system confirms the request and notifies the patient of its status (pending, confirmed, or waitlisted).

Exceptions:

1. No available time slots for the selected counselor.
2. The counselor's schedule changes before confirmation.
3. System error while saving the appointment request to the database.

Preconditions:

1. Patient must have a valid account and be logged into the system.
2. The counselor’s schedule must be updated in the system.
3. System database must be operational and accessible.

Postconditions:

1. Successful Request: The appointment request is logged in the system and visible to both the patient and counselor.

2. Unsuccessful Request: The system notifies the patient of the issue and suggests alternate options, such as waitlisting or selecting another counselor.
3. Exception: System logs the error, and the patient remains on the same page or receives an error message.

4)Use Case Name: Provides Feedback

Actor: Counselor, Patient

Scenario / Description:

1. The actor (counselor or patient) logs into the system.
2. The actor navigates to the feedback section.
3. The actor selects the feedback type (session feedback or overall experience).
4. The actor writes feedback in the provided text box.
5. The system validates and submits the feedback.
6. The system stores the feedback securely in the database.

Exceptions:

1. Feedback form fails to load due to server or network issues.
2. Feedback submission fails due to a database error.
3. Actor leaves mandatory fields empty.

Preconditions:

1. The actor must be logged into the system.
2. The feedback module must be accessible.

Postconditions:

1. Successful Submission: Feedback is successfully saved in the database and marked as submitted.
2. Unsuccessful Submission: System displays an error message and allows the actor to try again.
3. Exception: The actor is informed of the issue, and the system logs the error for administrative review.

5)Use Case Name: View Schedule:

Actor: Patient

Scenario / Description:

1. Patient logs into the system using their credentials.
2. Patient navigates to the "View Schedule" section from the dashboard.
3. The system retrieves the patient's scheduled appointments from the database.
4. The system displays the list of upcoming and past appointments, including counselor details, appointment dates, times, and status.
5. Patient reviews the displayed schedule.

Exceptions:

1. No scheduled appointments found for the patient.
2. The system fails to retrieve schedule data due to a database connection issue.

Preconditions:

1. The patient must be logged into the system.
2. Scheduled appointments for the patient must exist in the database.

Postconditions:

1. **Successful View:** The patient views the schedule successfully, including all relevant appointment details.
2. **Unsuccessful View:** An error message is displayed if no appointments are found or if there is a system error.
3. **Exception:** The system remains on the "View Schedule" page and prompts the patient to try again later.

6)Use Case Name: Search and Filter Appointment Slots;

Actor: Patient, Counselor, Administrator

Scenario / Description:

1. User (Patient, Counselor, or Administrator) accesses the appointment scheduling page.
2. User inputs search criteria such as date, time, counselor name, or availability status.
3. System retrieves and displays available slots based on the provided criteria.
4. User applies additional filters (e.g., slot duration, counselor specialization, or time of day).
5. System updates the results dynamically based on applied filters.
6. User selects a slot for booking or takes further action (e.g., viewing details or adding a patient to a waitlist).

Exceptions:

1. No slots match the provided search criteria or filters.
2. The database connection fails during the search process.
3. System timeout occurs while retrieving slot data.

Preconditions:

1. User must be logged in with appropriate credentials.
2. Counselors’ schedules must be preloaded and up-to-date in the database.
3. The system must be connected to the database.

Postconditions:

1. **Successful Search:** The system displays matching appointment slots for the user to select.
2. **Unsuccessful Search:** System displays a message indicating no matching slots were found and suggests alternate actions.
3. **Exception:** User remains on the search page and may retry the process after resolving the issue (e.g., refreshing the page or reconnecting).

7)Use Case Name: View Patient Records:

Actor: Patient, Counselor

Scenario / Description:

1. The counselor logs into the system and navigates to the patient records section.
2. The counselor searches for a specific patient by name or ID.
3. The system retrieves and displays the patient’s profile and session history.
4. The counselor views detailed information about past sessions and notes.
5. The patient logs in and accesses their own session history and progress reports.

Exceptions:

1. Patient record not found (e.g., incorrect ID or no existing profile).
2. Database connection error prevents the retrieval of records.
3. Unauthorized access attempt by a patient to another patient’s records.

Preconditions:

1. The user (patient or counselor) must be logged into the system.
2. Patient records must exist in the database.
3. The user’s role must be authenticated (patients can only view their own records, counselors can view assigned patients’ records).

Postconditions:

1. **Successful View:** The requested records are displayed on the screen.
2. **Unsuccessful View:** The system shows an appropriate error message (e.g., "Record not found").
3. **Exception:** The user is redirected to a help or error page if an issue occurs.

8)Use Case Name: Edit Profile:

Actor: Patient, Counselor, Administrator

Scenario / Description:

1. The user (Patient, Counselor, or Administrator) logs into the system.
2. The user navigates to the **"Edit Profile"** section on their dashboard.
3. The system displays the current profile details (e.g., name, email, phone number, password, and other relevant information).

4. The user modifies the desired fields.
5. The user submits the changes by clicking the **"Save"** button.
6. The system validates the input (e.g., checks for valid email formats, password criteria, etc.).
7. Upon successful validation, the system updates the user's profile in the database and displays a confirmation message.

Exceptions:

1. **Invalid Input:** The system detects invalid entries (e.g., incorrect email format, weak password).
2. **Database Connection Error:** The system fails to update the profile due to a lack of connection to the database.
3. **Unauthorized Access:** User attempts to edit fields restricted to their role (e.g., Patients cannot modify permissions).

Preconditions:

1. The user must be logged into the system.
2. The user must have access to their profile page.
3. The system must be connected to the database.

Postconditions:

1. **Successful Update:** The user’s profile information is updated in the system, and the changes reflect in future interactions.
2. **Unsuccessful Update:** The system displays appropriate error messages and retains the old profile information.
3. **Exception:** The user remains on the **"Edit Profile"** page with the previous information intact.

9)Use Case Name: Register Counselor:

Actor: Administrator

Scenario / Description:

1. Administrator navigates to the “Register Counselor” section in the system.
2. Administrator inputs the counselor’s details (e.g., name, contact information, specialization).
3. System validates the entered details.
4. System assigns a unique ID to the counselor.
5. System saves the counselor's profile in the database.
6. Confirmation message is displayed to the administrator.

Exceptions:

1. Required fields are left empty (e.g., name, contact information).
2. Database connection is unavailable, preventing saving the counselor profile.

3. Duplicate entry detected (e.g., same email or contact information already exists).

Preconditions:

1. Administrator must be logged into the system with appropriate privileges.
2. System must be connected to the database.

Postconditions:

1. **Successful Registration:** The counselor’s profile is created and stored in the database.
2. **Unsuccessful Registration:** The system displays an error message prompting the administrator to correct input.
3. **Exception:** Administrator remains on the same page to resolve issues.

10)Use Case Name: View Assigned Appointments:

Actor: Counselor, Administrator

Scenario / Description:

1. Counselor or administrator logs into the system.
2. The actor navigates to the "View Appointments" section on their dashboard.
3. The system retrieves and displays a list of assigned appointments, filtered by date and status (e.g., confirmed, pending, completed).
4. The actor selects a specific appointment to view details, such as patient name, appointment time, and session notes (if applicable).

Exceptions:

1. No assigned appointments found for the selected date or criteria.
2. The system fails to load appointment data due to a database connection error.

Preconditions:

1. The actor (counselor or administrator) must be logged into the system.
2. The system must have access to the appointment database.

Postconditions:

1. **Successful View:** The actor can view all assigned appointments and their details.
2. **Unsuccessful View:** An error message is displayed if no data is found or if there is a technical issue.
3. **Exception:** The system suggests troubleshooting steps (e.g., refresh the page or contact support).

11)Use Case Name: Updates Patient Session Records:

Actor: Counselor

Scenario / Description:

1. Counselor logs into the system and navigates to the patient's profile.
2. Counselor selects the patient’s record to view their history.
3. Counselor adds details about the new session, including date, time, topics discussed, and recommendations.
4. Counselor saves the session record.
5. The system updates the patient's record in the database.

Exceptions:

1. Patient record not found in the database.
2. Database connection error prevents saving the session details.
3. Counselor session timeout due to inactivity before saving updates.

Preconditions:

1. The counselor must be logged into the system with the necessary permissions.
2. The patient’s profile must already exist in the system.
3. The system must be connected to the database.

Postconditions:

1. **Successful Update:** The session record is saved, and the patient's profile is updated.
2. **Unsuccessful Update:** Counselor remains on the same page with an error message prompting a retry.
3. **Exception:** Counselor reports the issue, and an administrator resolves it.

12)Use Case Name: Manage User Accounts:

Actor: Administrator

Scenario / Description:

1. Administrator logs into the system.
2. Administrator navigates to the "User Management" section.
3. Administrator views the list of users (patients, counselors, and other administrators).
4. Administrator performs one of the following actions:
    - Add a new user by filling in required details (name, role, contact info, etc.).
    - Edit an existing user’s details (e.g., update contact information, reset password, change role).
    - Deactivate or delete a user account if necessary.
5. System updates the database with changes.
6. Administrator confirms the action, and the system displays a success message.

Exceptions:

1. User details are incomplete or invalid (e.g., missing required fields).
2. Database connection fails, preventing updates.

3. Attempt to delete or deactivate a user with active sessions or dependencies (e.g., counselors with scheduled appointments).

Preconditions:

1. Administrator must be logged into the system with appropriate permissions.
2. User data must exist in the system database.
3. System must be online and connected to the database.

Postconditions:

1. **Successful Action:** User account is added, updated, or deactivated as requested.
2. **Unsuccessful Action:** System displays an error message, and no changes are made.
3. **Exception:** Administrator is prompted to resolve conflicts (e.g., reassign active dependencies).

13)Use Case Name: Manages Appointments:

Actor: Administrator

Scenario / Description:

1. Administrator logs into the system.
2. Administrator views pending appointment requests.
3. Administrator approves, modifies, or rejects the appointment requests based on availability and conflicts.
4. Administrator assigns an alternate counselor if the preferred counselor is unavailable.
5. System updates the schedules of the counselor and patient accordingly.
6. Notifications are sent to the patient and counselor regarding the updated appointment status.

Exceptions:

1. The required page to view or manage appointments is not accessible.
2. Database connection fails, preventing updates or notifications.
3. Conflict arises due to overlapping appointments or double booking.

Preconditions:

1. Administrator must be logged in with valid credentials.
2. Appointment requests must exist in the system.
3. Counselor schedules must be up-to-date in the database.

Postconditions:

1. **Successful Management:** Appointments are approved or reassigned, and all users are notified of the updates.
2. **Unsuccessful Management:** Administrator remains on the same page with error messages, prompting them to retry.

3. **Exception:** Administrator is alerted to resolve technical issues or conflicts manually.

14)Use Case Name: Update Schedule:

Actor: Counselor

Scenario / Description:

1. The counselor logs into the system.
2. The system displays the counselor’s dashboard.
3. The counselor navigates to the "Update Schedule" section.
4. The system shows the counselor’s existing appointments and availability.
5. The counselor:
   - Updates availability for specific time slots.
   - Cancels an existing appointment if necessary.
6. The system updates the schedule dynamically and notifies the affected patients.

Exceptions:

1. **Schedule Update Failure:** The system fails to save changes due to database errors or connectivity issues.
2. **Notification Failure:** The system fails to notify patients of updated schedules.
3. **Concurrent Update Conflict:** Another administrator or counselor updates the same slot simultaneously.

Preconditions:

1. The counselor must be logged in and authenticated.
2. The counselor must have a pre-existing schedule or active appointments.
3. The system must be connected to the database to retrieve and update schedules.

Postconditions:

1. **Successful Schedule Update:**
   - The counselor’s schedule is updated in the system.
   - Patients affected by schedule changes are notified.
2. **Unsuccessful Schedule Update:**
   - The system retains the original schedule and notifies the counselor of the failure.
3. **Exception:**
   - The counselor remains on the schedule management page, and an error message is displayed if possible.

15)Use Case Name: Manage Counselors (Assign or Reassign):

Actor: Administrator

Scenario / Description:

1. Administrator logs into the system and navigates to the "Manage Counselors" section.
2. Administrator searches for a patient who needs to be assigned or reassigned to a counselor.
3. The system displays a list of available counselors based on workload, expertise, and availability.
4. Administrator selects a counselor to assign or reassign to the patient.
5. The system updates the patient’s record with the assigned counselor's details.
6. Notifications are sent to both the counselor and the patient about the new assignment or reassignment.

Exceptions:

1. No counselors are available for assignment due to full schedules or leave.
2. The system encounters a database error while updating records.
3. Notification to the counselor or patient fails due to connectivity issues.

Preconditions:

1. Administrator must be logged into the system with appropriate permissions.
2. Patient and counselor profiles must exist in the database.
3. System must be connected to the database to fetch and update records.

Postconditions:

1. **Successful Assignment/Reassignment:** Patient is linked to the selected counselor, and both parties are notified.
2. **Unsuccessful Assignment/Reassignment:** The system informs the administrator about the issue (e.g., no available counselors).
3. **Exception:** Administrator is prompted to manually handle the assignment or resolve the issue.

16)Use Case Name: System Maintenance:

Actor: Administrator

Scenario / Description:

1. Administrator logs into the system with appropriate credentials.
2. The system schedules a maintenance session (e.g., backup and updates).
3. The system automatically performs data backup every Friday at 00:00 for 1 minute.
4. Old and unnecessary data older than 30 days is deleted.
5. The system ensures that all encrypted sensitive data remains secure during the process.
6. Administrator reviews the maintenance logs to ensure the process completed successfully.

Exceptions:

1. Backup process fails due to insufficient storage.
2. Database connection error prevents data deletion.
3. Scheduled maintenance fails due to a server issue.

Preconditions:

1. Administrator must be logged into the system with appropriate privileges.
2. Backup configurations and scheduled tasks must be set in the system.
3. The system should have access to the necessary database and storage.

Postconditions:

1. **Successful Maintenance:** Backup is completed, unnecessary data is deleted, and logs are updated.
2. **Unsuccessful Maintenance:** Administrator is notified of the failure, and corrective action is taken.
3. **Exception:** System retries the failed tasks automatically or sends alerts to the administrator.

17)Use Case Name: Database Management:

Actor: Administrator

Scenario / Description:

1. Administrator logs into the system.
2. Accesses the database management section through the admin dashboard.
3. Performs required actions such as:
   - Creating backups of the database.
   - Cleaning up old or unnecessary data every 30 days.
   - Monitoring database performance and ensuring data integrity.
4. Receives confirmation for each action performed.

Exceptions:

1. Backup process fails due to insufficient storage space.
2. Database connection is unavailable.
3. Unauthorized access attempt detected.

Preconditions:

1. Administrator must be logged into the system with appropriate privileges.
2. The system must have an active connection to the database.
3. Backup and cleanup schedules must be predefined in the system.

Postconditions:

1. **Successful Database Management:**
   - Backups are created and stored securely.
   - Unnecessary data is deleted to free up storage space.

    - Database performance and integrity are maintained.
2. **Unsuccessful Database Management:**
    - Errors are logged, and the administrator is notified for troubleshooting.
3. **Exception:**
    - Administrator remains in the database management section and attempts to resolve issues or retry actions.

18)Use Case Name: Payment Tracking:

Actor: Administrator, Payment Gateway (External System)

Scenario / Description:

1. Patient initiates a payment for a session using the system.
2. The system redirects the payment details to the Payment Gateway.
3. Payment Gateway processes the transaction and sends a response (success or failure) to the system.
4. System updates the payment status in the patient's record.
5. Administrator accesses the payment management interface to review or track payment history.
6. Administrator resolves discrepancies or handles refunds if necessary.

Exceptions:

1. Payment Gateway is unreachable or returns an error.
2. Payment transaction fails due to insufficient funds or incorrect details.
3. System fails to update the payment status in the database.

Preconditions:

1. Patient's session and fee details must be recorded in the system.
2. Payment Gateway must be operational and integrated with the system.
3. Administrator must have access to the payment management dashboard.

Postconditions:

1. **Successful Payment:** Payment is recorded, and the receipt is generated for the patient.
2. **Unsuccessful Payment:** An error message is displayed to the patient, and the administrator is notified if necessary.
3. **Exception:** The payment status remains unresolved until the administrator intervenes to investigate or manually update the record.

19)Use Case Name: View Payment History and Make Payment:

Actor: Patient, Payment Gateway (External System)

Scenario / Description:

1. Patient logs into the system and navigates to the "Payments" section.
2. Patient selects the "View Payment History" option.
3. The system retrieves and displays the patient’s payment history from the database.
4. If the patient needs to make a payment, they select the "Make Payment" option.
5. The system prompts the patient to choose a payment method (e.g., Mobile Financial Services (MFS) or card payment).
6. Patient enters payment details and confirms the transaction.
7. The system redirects the request to the Payment Gateway.
8. Payment Gateway processes the transaction and sends a confirmation or failure status back to the system.
9. The system updates the patient’s payment history with the new transaction and displays a receipt.

Exceptions:

1. Payment Gateway fails to process the transaction due to network issues or incorrect payment details.
2. System fails to retrieve payment history from the database.
3. Patient cancels the payment process before completion.

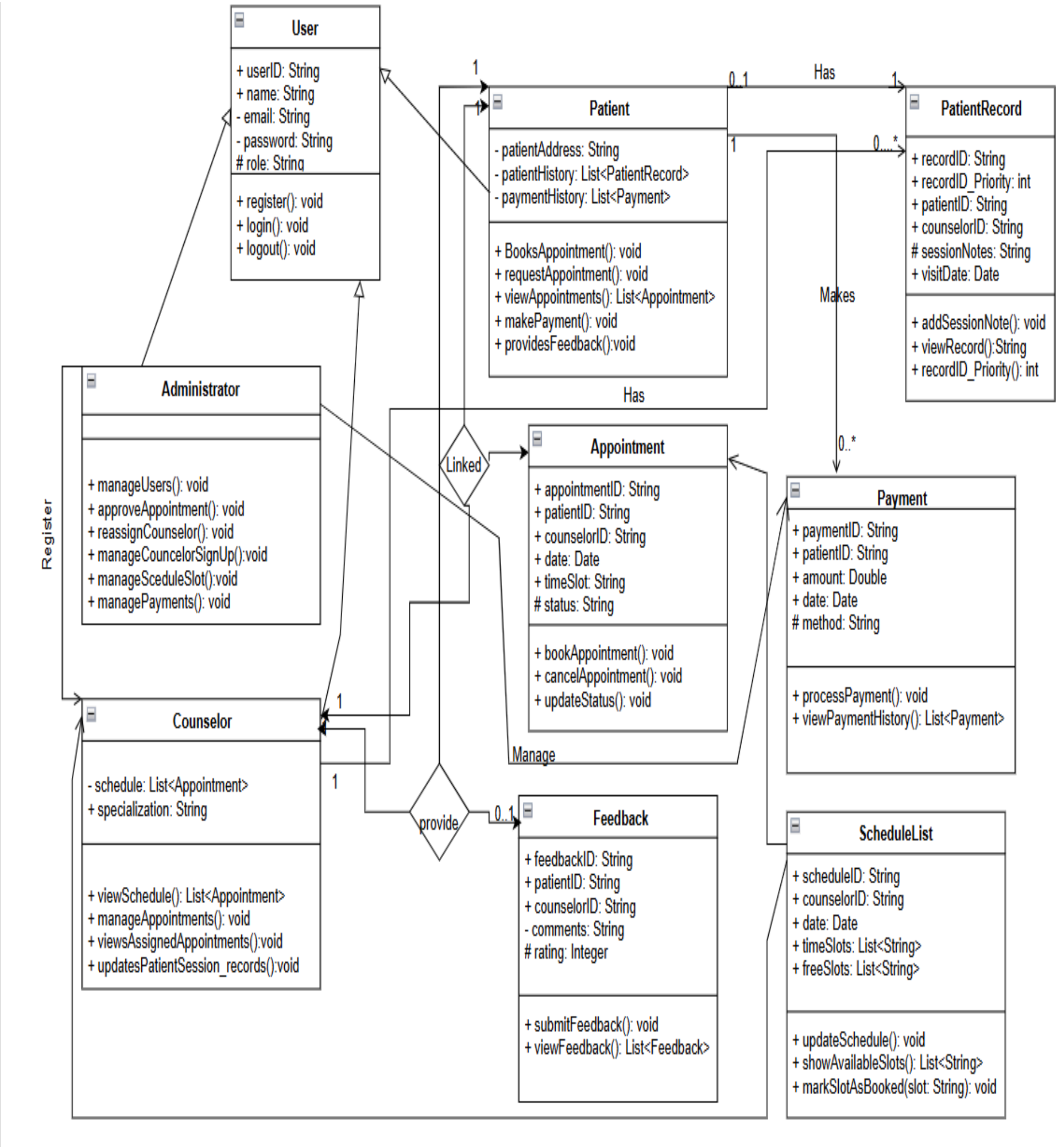
Preconditions:

1. Patient must be logged into the system.
2. Payment Gateway must be operational and accessible.
3. Payment history must exist in the database for viewing.

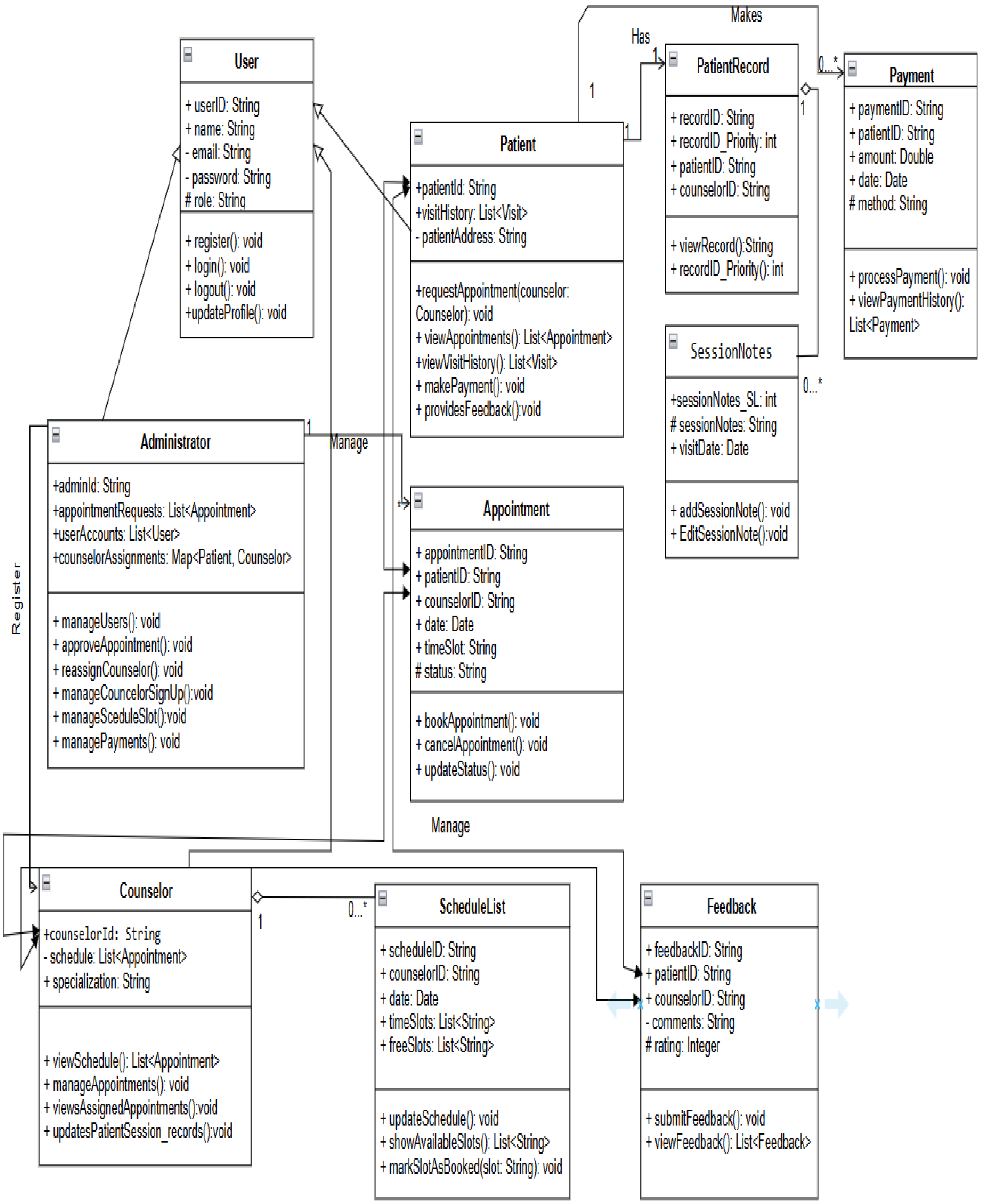
Postconditions:

1. **Successful Payment:** The payment is processed successfully, and the system updates the patient’s payment history.
2. **Unsuccessful Payment:** The system displays an error message and allows the patient to retry.
3. **View Payment History:** The patient’s payment history is displayed accurately.

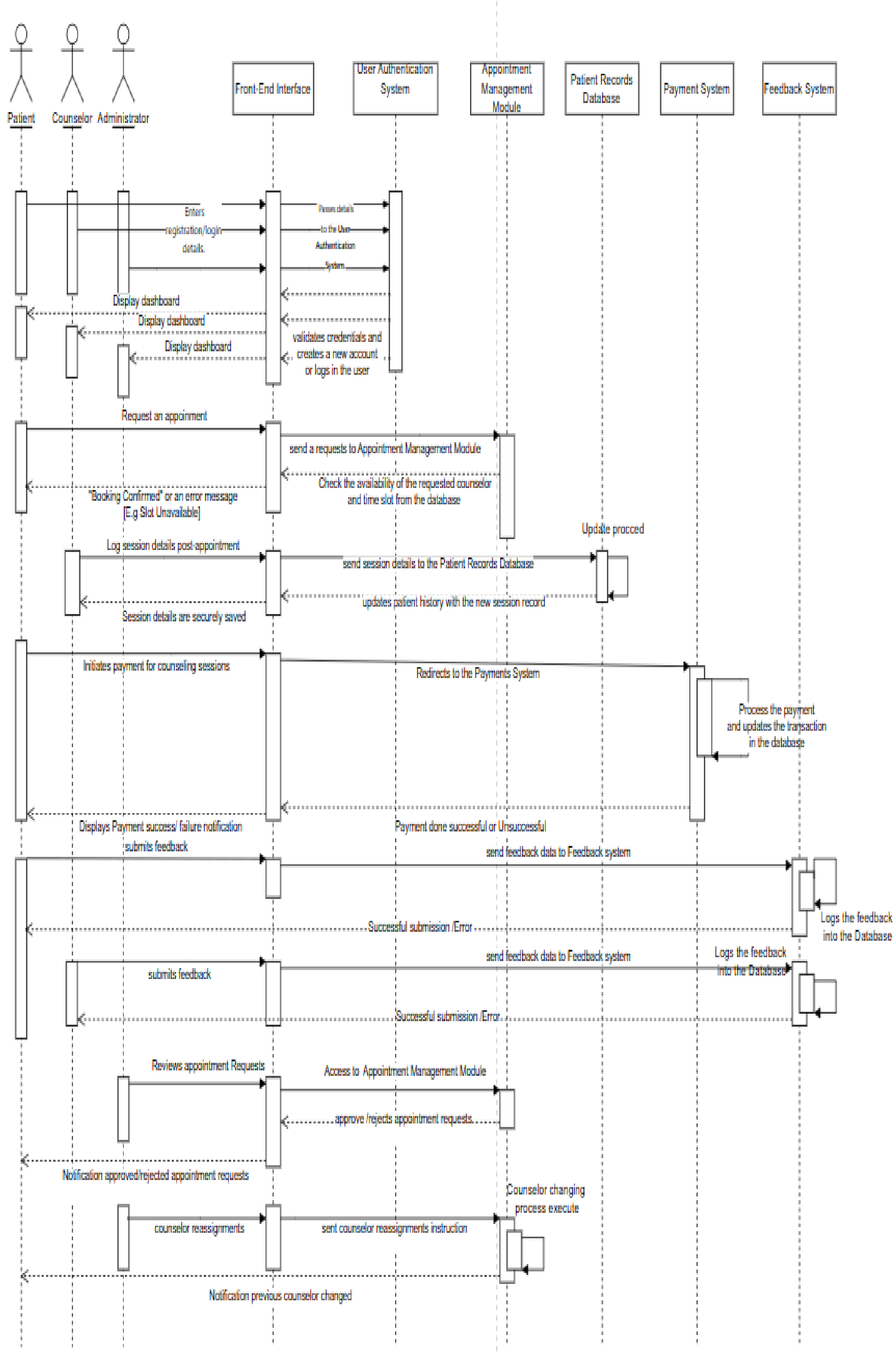
Class Diagram(OLD version):



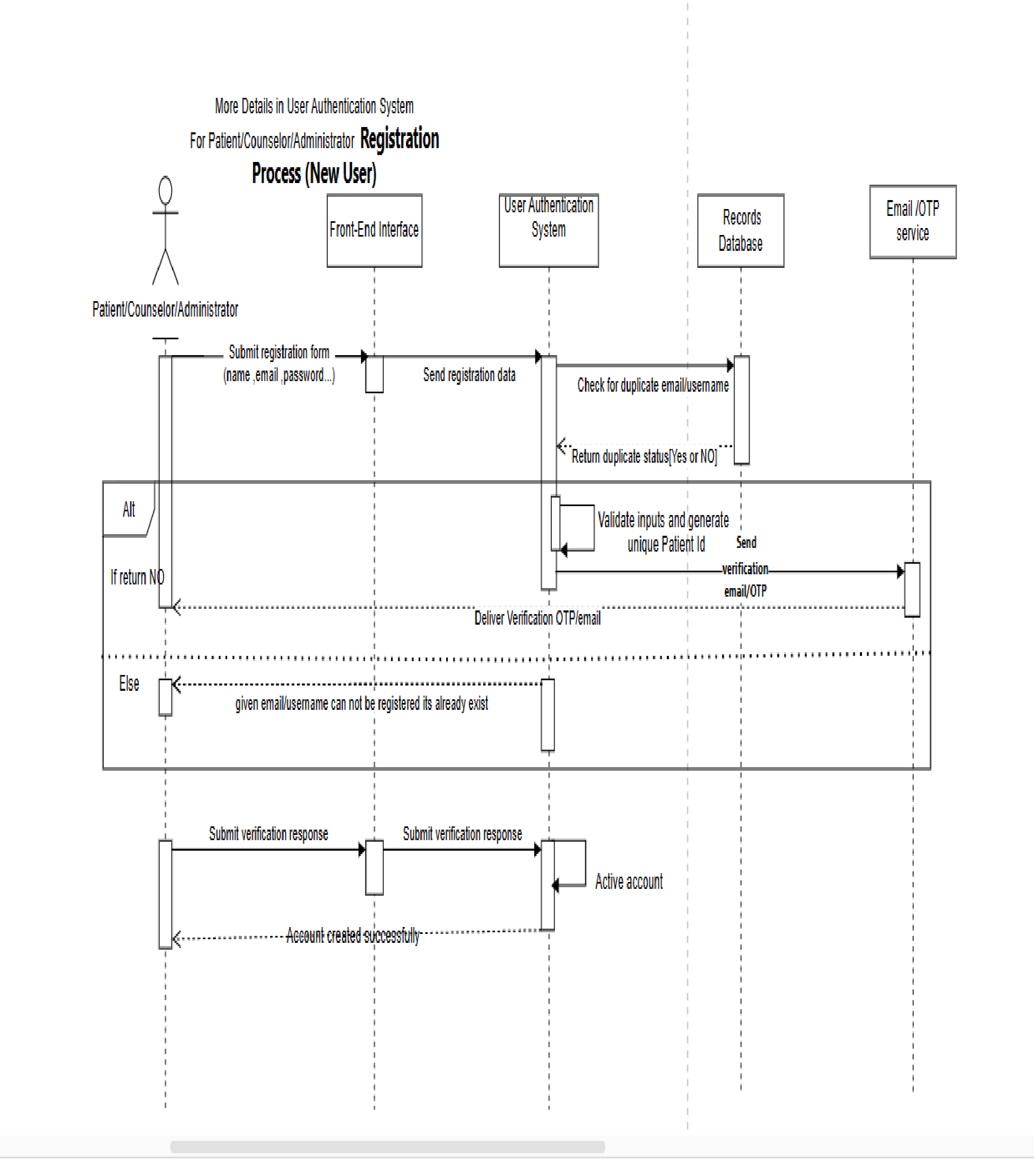
Class Diagram(Updated version):



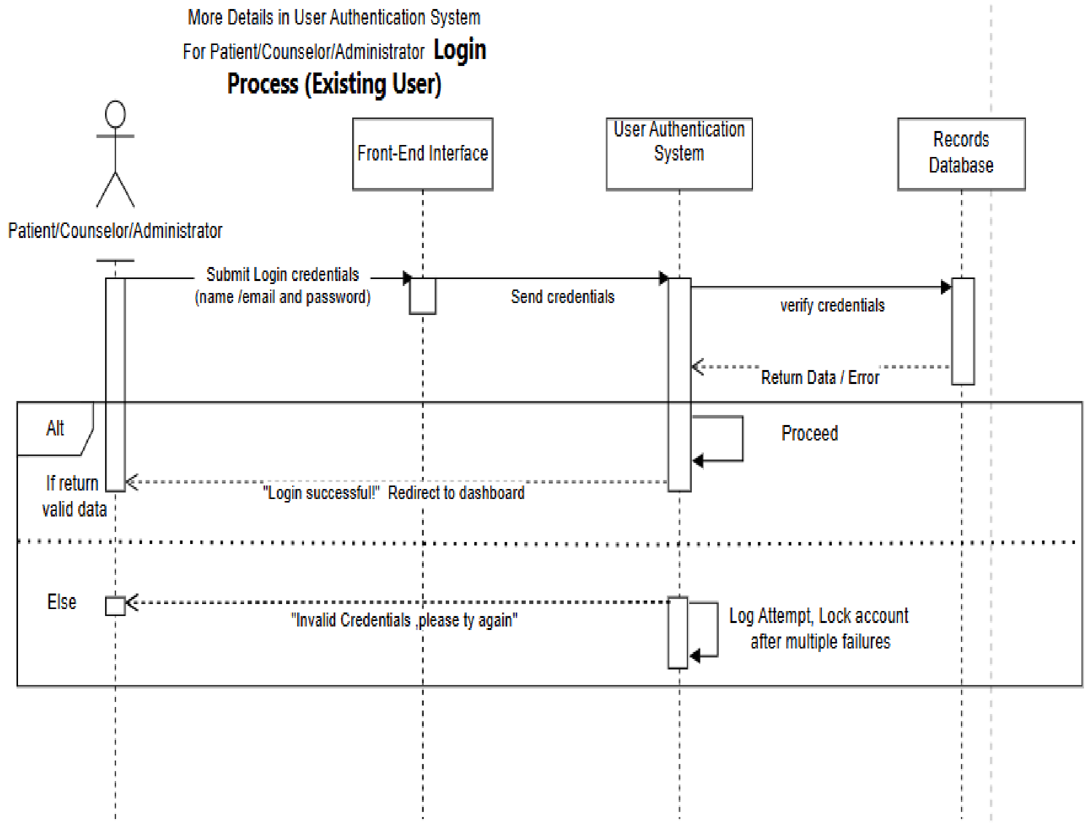
Sequence Diagram:[Full system]


Patient
Counselor
Administrator
Front-End Interface
User Authentication System
Appointment Management Module
Patient Records Database
Payment System
Feedback System
Enters registration/login details.
Passes details to the User Authentication System
Display dashboard
Display dashboard
Display dashboard
validates credentials and creates a new account or logs in the user
Request an appoinment
send a requests to Appointment Management Module
Check the availability of the requested counselor and time slot from the database
"Booking Confirmed" or an error message [E.g Slot Unavailable]
Update procced
Log session details post-appointment
send session details to the Patient Records Database
updates patient history with the new session record
Session details are securely saved
Initiates payment for counseling sessions
Redirects to the Payments System
Process the payment and updates the transaction in the database
Displays Payment success/ failure notification
Payment done successful or Unsuccessful
submits feedback
send feedback data to Feedback system
Logs the feedback into the Database
Successful submission /Error
send feedback data to Feedback system
Logs the feedback into the Database
submits feedback
Successful submission /Error
Reviews appointment Requests
Access to Appointment Management Module
approve /rejects appointment requests
Notification approved/rejected appointment requests
Counselor changing process execute
counselor reassignments
sent counselor reassignments instruction
Notification previous counselor changed

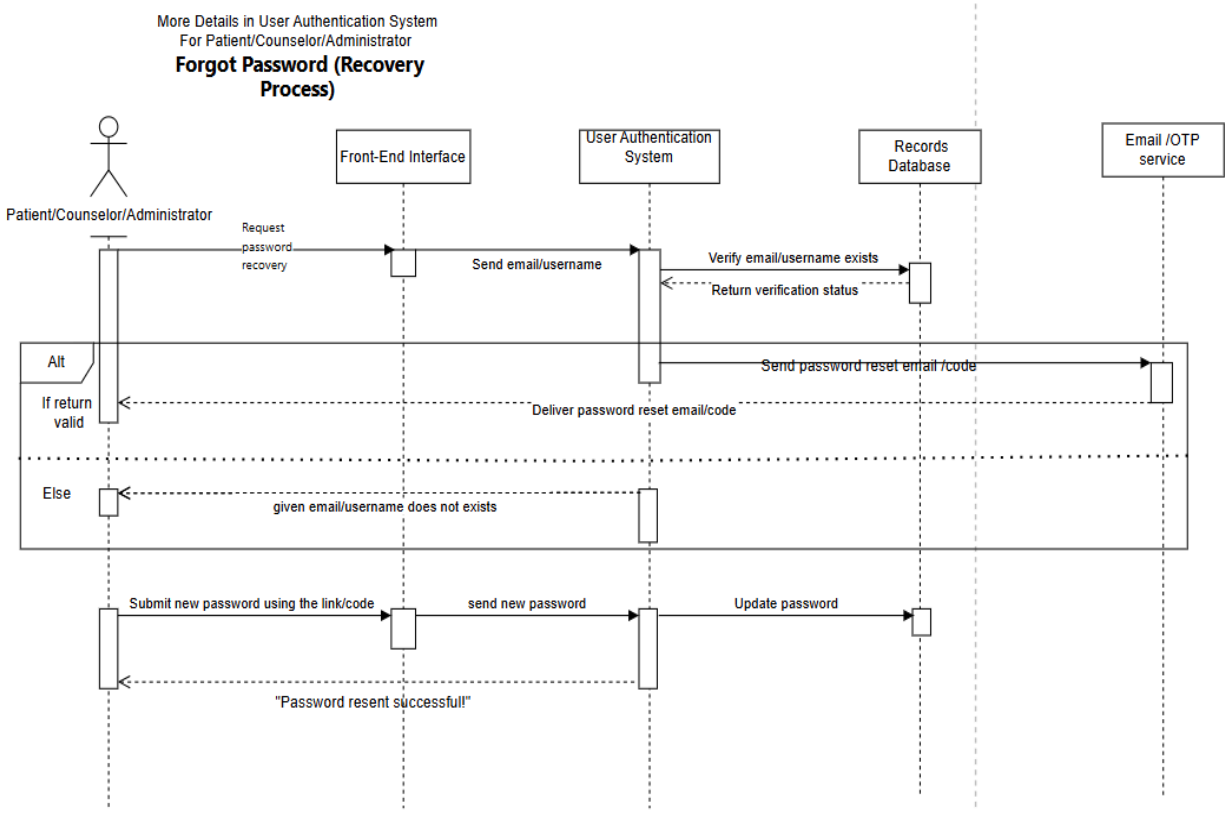
Sequence Diagram:[Registration Process Part]


More Details in User Authentication System
For Patient/Counselor/Administrator Registration
Process (New User)
Front-End Interface
User Authentication System
Records Database
Email /OTP service
Patient/Counselor/Administrator
Submit registration form (name ,email ,password...)
Send registration data
Check for duplicate email/username
Return duplicate status[Yes or NO]
Alt
Validate inputs and generate unique Patient Id
Send verification email/OTP
If return NO
Deliver Verification OTP/email
Else
given email/username can not be registered its already exist
Submit verification response
Submit verification response
Active account
Account created successfully

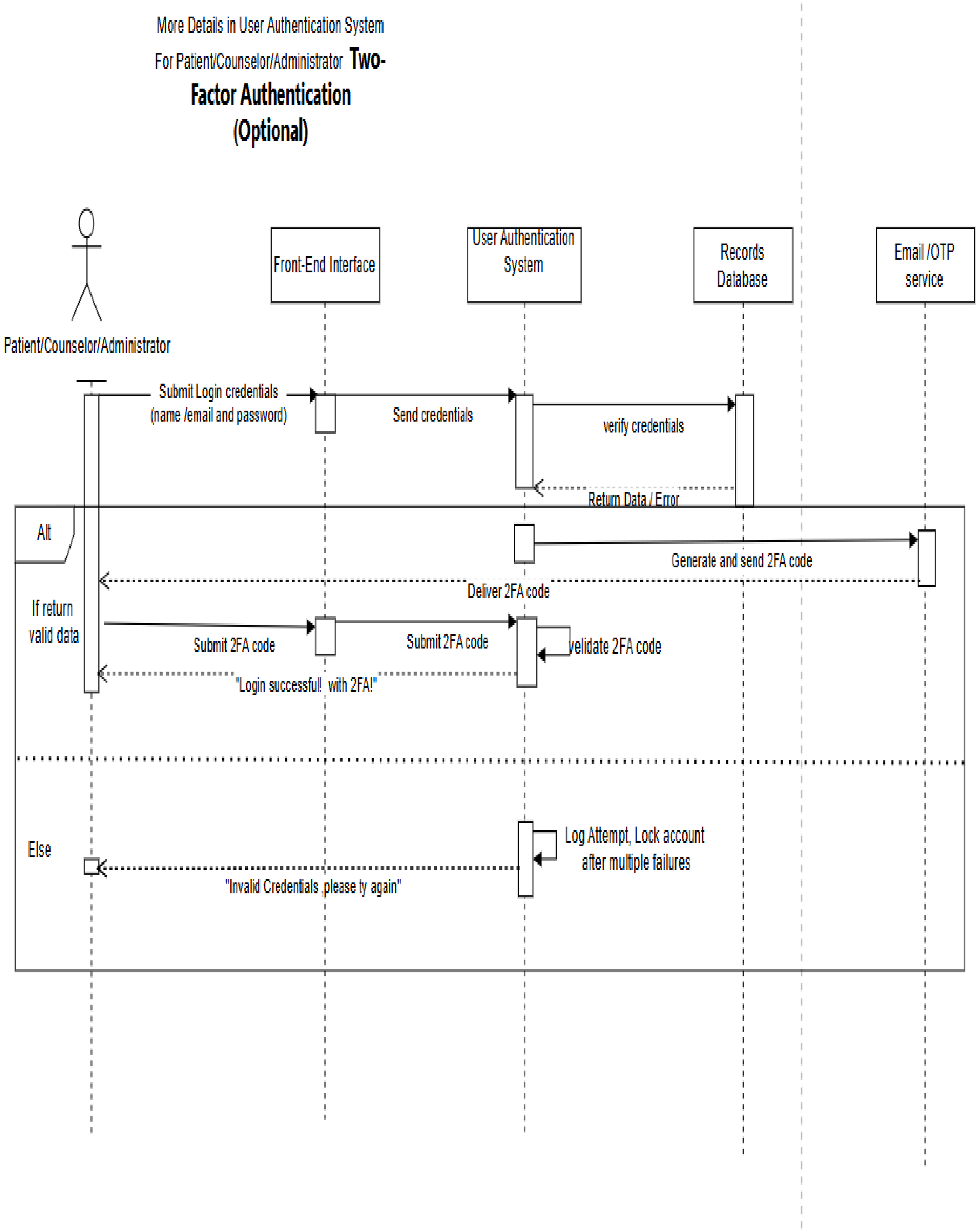
Sequence Diagram:[Log in Process Part]


More Details in User Authentication System
For Patient/Counselor/Administrator Login
Process (Existing User)
Patient/Counselor/Administrator
Front-End Interface
User Authentication System
Records Database
Submit Login credentials
(name /email and password)
Send credentials
verify credentials
Return Data / Error
Alt
Proceed
If return valid data
"Login successful!" Redirect to dashboard
Else
"Invalid Credentials ,please ty again"
Log Attempt, Lock account after multiple failures

Sequence Diagram:[Forget Password Part]


More Details in User Authentication System
For Patient/Counselor/Administrator
Forgot Password (Recovery Process)
Patient/Counselor/Administrator
Front-End Interface
User Authentication System
Records Database
Email /OTP service
Request password recovery
Send email/username
Verify email/username exists
Return verification status
Alt
Send password reset email /code
If return valid
Deliver password reset email/code
Else
given email/username does not exists
Submit new password using the link/code
send new password
Update password
"Password resent successful!"

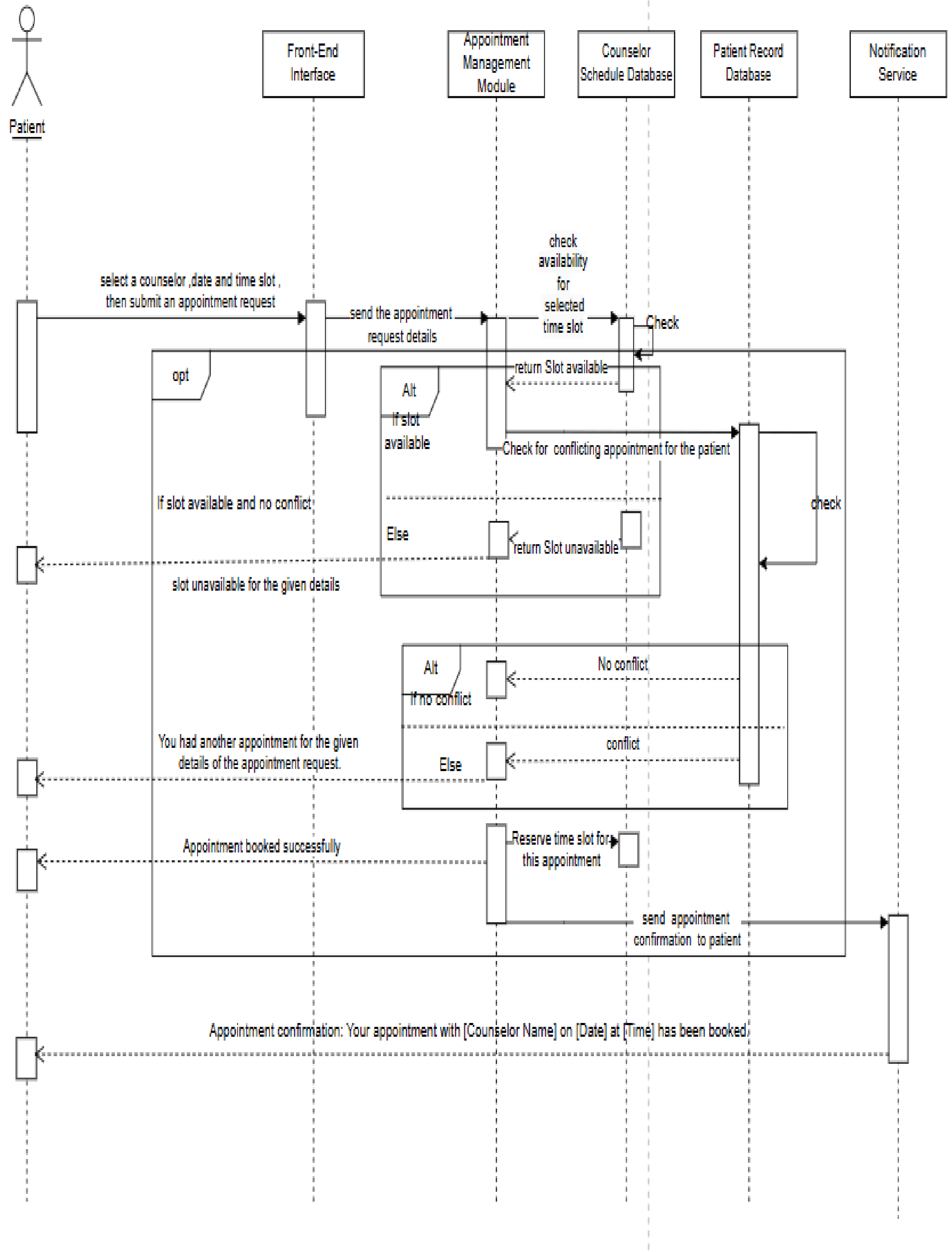
Sequence Diagram:[Two-Factor Authentication Part]


More Details in User Authentication System
For Patient/Counselor/Administrator Two-
Factor Authentication
(Optional)
Patient/Counselor/Administrator
Front-End Interface
User Authentication System
Records Database
Email /OTP service
Submit Login credentials
(name /email and password)
Send credentials
verify credentials
Return Data / Error
Alt
If return valid data
Generate and send 2FA code
Deliver 2FA code
Submit 2FA code
Submit 2FA code
velidate 2FA code
"Login successful! with 2FA!"
Else
Log Attempt, Lock account
after multiple failures
"Invalid Credentials ,please ty again"

Sequence Diagram:[Appointment Request by Patient_ Part]

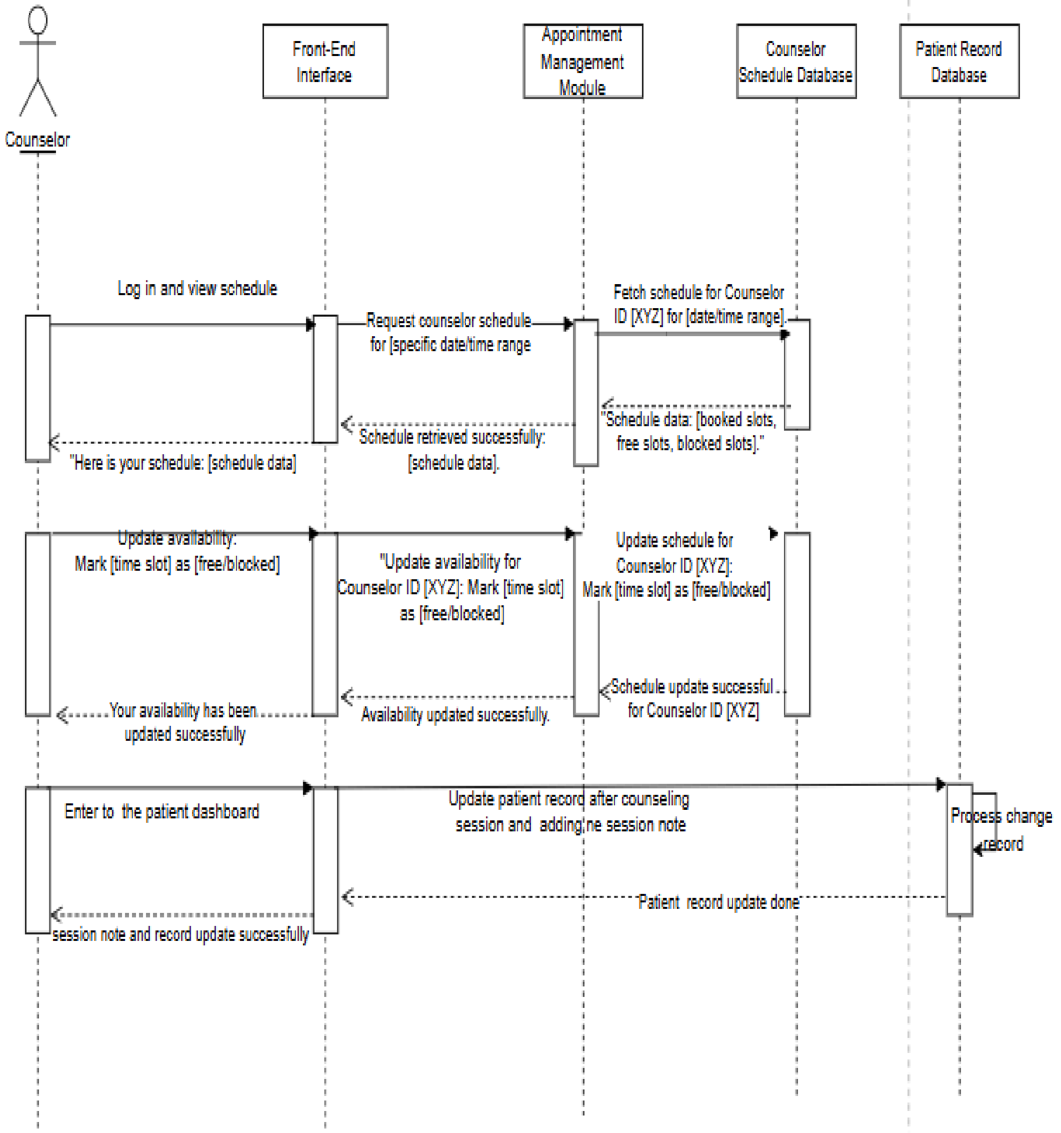
A details of the Sequence Diagram for the Appointment Scheduling

Process: Appointment Request by Patient.

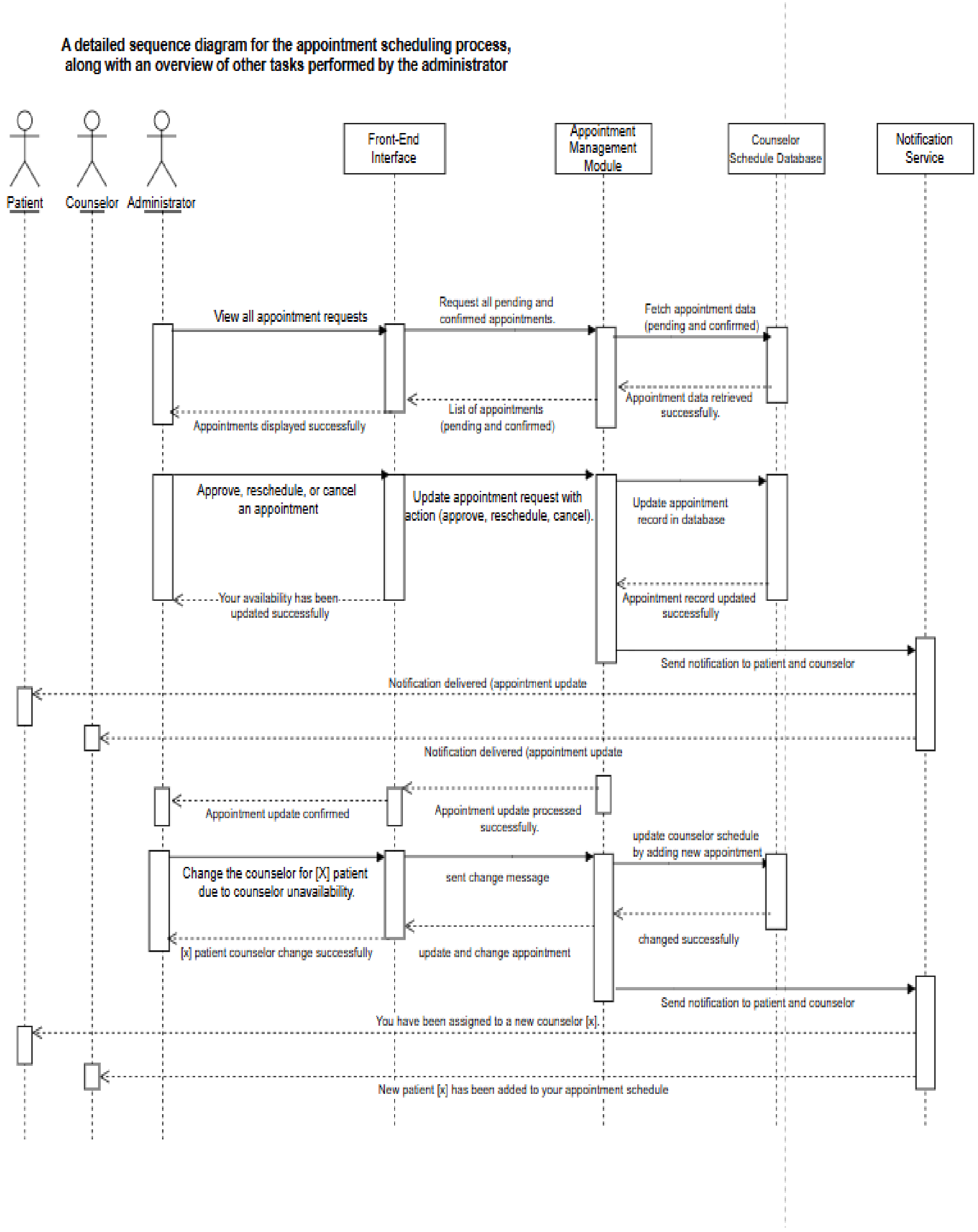

Patient
Front-End Interface
Appointment Management Module
Counselor Schedule Database
Patient Record Database
Notification Service
select a counselor ,date and time slot , then submit an appointment request
send the appointment request details
check availability for selected time slot
Check
opt
return Slot available
Alt
If slot available
Check for conflicting appointment for the patient
check
If slot available and no conflict
Else
return Slot unavailable
slot unavailable for the given details
Alt
If no conflict
No conflict
You had another appointment for the given details of the appointment request.
conflict
Else
Appointment booked successfully
Reserve time slot for this appointment
send appointment confirmation to patient
Appointment confirmation: Your appointment with [Counselor Name] on [Date] at [Time] has been booked.

Sequence Diagram:[appointment scheduling process and the patient record update workflow by the counselor _ Part]

A detailed sequence diagram illustrating the appointment scheduling process and the patient record update workflow by the counselor.


Counselor
Front-End Interface
Appointment Management Module
Counselor Schedule Database
Patient Record Database
Log in and view schedule
Request counselor schedule for [specific date/time range
Fetch schedule for Counselor ID [XYZ] for [date/time range].
"Schedule data: [booked slots, free slots, blocked slots]."
Schedule retrieved successfully: [schedule data].
"Here is your schedule: [schedule data]
Update availability: Mark [time slot] as [free/blocked]
"Update availability for Counselor ID [XYZ]: Mark [time slot] as [free/blocked]
Update schedule for Counselor ID [XYZ]: Mark [time slot] as [free/blocked]
Schedule update successful for Counselor ID [XYZ]
Availability updated successfully.
Your availability has been updated successfully
Enter to the patient dashboard
Update patient record after counseling session and adding ne session note
Process change record
Patient record update done
session note and record update successfully

Sequence Diagram:[appointment scheduling process, along with an overview of other tasks performed by the administrator _ Part]


A detailed sequence diagram for the appointment scheduling process,
along with an overview of other tasks performed by the administrator
Patient
Counselor
Administrator
Front-End Interface
Appointment Management Module
Counselor Schedule Database
Notification Service
View all appointment requests
Request all pending and confirmed appointments.
Fetch appointment data (pending and confirmed)
Appointment data retrieved successfully.
List of appointments (pending and confirmed)
Appointments displayed successfully
Approve, reschedule, or cancel an appointment
Update appointment request with action (approve, reschedule, cancel).
Update appointment record in database
Appointment record updated successfully
Your availability has been updated successfully
Send notification to patient and counselor
Notification delivered (appointment update
Notification delivered (appointment update
Appointment update processed successfully.
Appointment update confirmed
update counselor schedule by adding new appointment
Change the counselor for [X] patient due to counselor unavailability.
sent change message
changed successfully
update and change appointment
[x] patient counselor change successfully
Send notification to patient and counselor
You have been assigned to a new counselor [x].
New patient [x] has been added to your appointment schedule

Database Schema:

1)User(userID, name, email, password, role)

2)Patient (patientID, visitHistory, patientAddress)

3)Administrator (adminID)

4)Counselor(counselorID, specialization)

5)Appointment(appointmentID, patientID, counselorID, date, timeSlot, status)

6)PatientRecord(recordID, patientID, counselorID, priority)

7)Payment(paymentID, patientID, amount, date, method)

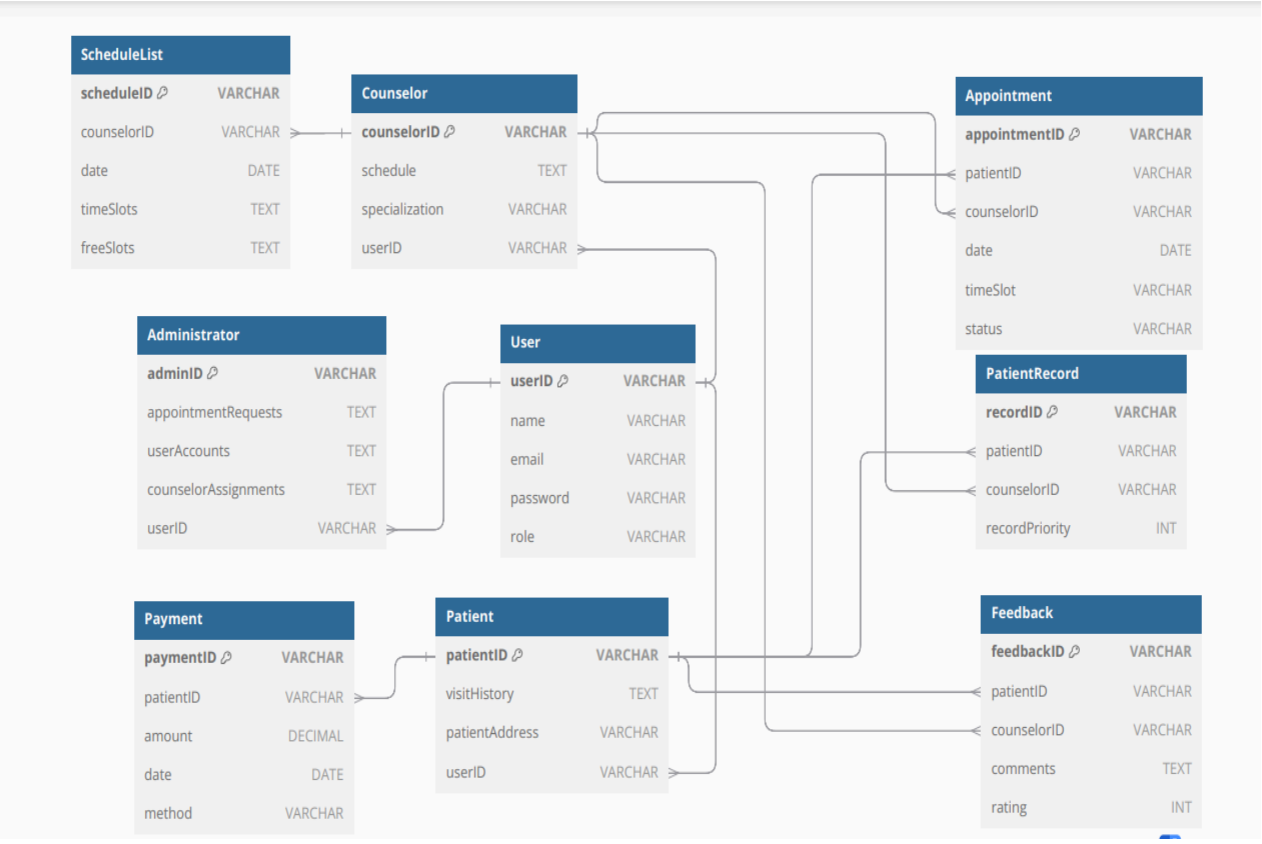
8)SessionNotes(sessionNotesID, recordID, sessionNotes, visitDate)
9)Feedback(feedbackID, patientID, counselorID, comments, rating)
10)ScheduleList(scheduleID, counselorID, date, timeSlots, freeSlots)

Database Schema (SQL) code:

```
-- User Table
CREATE TABLE User (
    userID VARCHAR(50) PRIMARY KEY,
    name VARCHAR(100) NOT NULL,
    email VARCHAR(100) UNIQUE NOT NULL,
    password VARCHAR(255) NOT NULL,
    role ENUM('Admin', 'Patient', 'Counselor') NOT NULL
);

-- Patient Table
CREATE TABLE Patient (
    patientID VARCHAR(50) PRIMARY KEY,
    visitHistory JSON,
    patientAddress VARCHAR(255),
    FOREIGN KEY (patientID) REFERENCES User(userID)
);

-- Administrator Table
CREATE TABLE Administrator (
    adminID VARCHAR(50) PRIMARY KEY,
    FOREIGN KEY (adminID) REFERENCES User(userID)
);

-- Counselor Table
CREATE TABLE Counselor (
    counselorID VARCHAR(50) PRIMARY KEY,
    specialization VARCHAR(100),
    FOREIGN KEY (counselorID) REFERENCES User(userID)
);

-- Appointment Table
CREATE TABLE Appointment (
    appointmentID VARCHAR(50) PRIMARY KEY,
    patientID VARCHAR(50) NOT NULL,
    counselorID VARCHAR(50) NOT NULL,
    date DATE NOT NULL,
    timeSlot VARCHAR(50) NOT NULL,
    status ENUM('Pending', 'Confirmed', 'Canceled') NOT NULL,
    FOREIGN KEY (patientID) REFERENCES Patient(patientID),
    FOREIGN KEY (counselorID) REFERENCES Counselor(counselorID)
);

-- PatientRecord Table
CREATE TABLE PatientRecord (
    recordID VARCHAR(50) PRIMARY KEY,
    patientID VARCHAR(50) NOT NULL,
    counselorID VARCHAR(50),
    priority INT NOT NULL,
    FOREIGN KEY (patientID) REFERENCES Patient(patientID),
    FOREIGN KEY (counselorID) REFERENCES Counselor(counselorID)
);

-- Payment Table
CREATE TABLE Payment (
    paymentID VARCHAR(50) PRIMARY KEY,
    patientID VARCHAR(50) NOT NULL,
    amount DECIMAL(10, 2) NOT NULL,
    date DATE NOT NULL,
    method ENUM('Cash', 'Card', 'Online') NOT NULL,
    FOREIGN KEY (patientID) REFERENCES Patient(patientID)
);

-- SessionNotes Table
CREATE TABLE SessionNotes (
    sessionNotesID VARCHAR(50) PRIMARY KEY,
    recordID VARCHAR(50) NOT NULL,
    sessionNotes TEXT,
    visitDate DATE NOT NULL,
    FOREIGN KEY (recordID) REFERENCES PatientRecord(recordID)
);

-- Feedback Table
```

```
CREATE TABLE Feedback (
    feedbackID VARCHAR(50) PRIMARY KEY,
    patientID VARCHAR(50) NOT NULL,
    counselorID VARCHAR(50) NOT NULL,
    comments TEXT,
    rating INT CHECK (rating BETWEEN 1 AND 5),
    FOREIGN KEY (patientID) REFERENCES Patient(patientID),
    FOREIGN KEY (counselorID) REFERENCES Counselor(counselorID)
);

-- ScheduleList Table
CREATE TABLE ScheduleList (
    scheduleID VARCHAR(50) PRIMARY KEY,
    counselorID VARCHAR(50) NOT NULL,
    date DATE NOT NULL,
    timeSlots JSON,
    freeSlots JSON,
    FOREIGN KEY (counselorID) REFERENCES Counselor(counselorID)
);
```

ER_Diagram:



ScheduleList	
scheduleID	VARCHAR
counselorID	VARCHAR
date	DATE
timeSlots	TEXT
freeSlots	TEXT

Counselor	
counselorID	VARCHAR
schedule	TEXT
specialization	VARCHAR
userID	VARCHAR

Appointment	
appointmentID	VARCHAR
patientID	VARCHAR
counselorID	VARCHAR
date	DATE
timeSlot	VARCHAR
status	VARCHAR

Administrator	
adminID	VARCHAR
appointmentRequests	TEXT
userAccounts	TEXT
counselorAssignments	TEXT
userID	VARCHAR

User	
userID	VARCHAR
name	VARCHAR
email	VARCHAR
password	VARCHAR
role	VARCHAR

PatientRecord	
recordID	VARCHAR
patientID	VARCHAR
counselorID	VARCHAR
recordPriority	INT

Payment	
paymentID	VARCHAR
patientID	VARCHAR
amount	DECIMAL
date	DATE
method	VARCHAR

Patient	
patientID	VARCHAR
visitHistory	TEXT
patientAddress	VARCHAR
userID	VARCHAR

Feedback	
feedbackID	VARCHAR
patientID	VARCHAR
counselorID	VARCHAR
comments	TEXT
rating	INT

Conclusion:

Our Web Application project will provide potential user a smooth user-friendly experience with minimum response rate and a robust system to make therapist scheduling simple and easy. It will provide a secure data handling and user authentication and many alternative payment method to ease up the user’s pain.